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(54) Title: METHOD FOR VISUALLY AND AUDIBLY REPRESENTING COMPUTER INSTRUCTIONS FOR EDITING VIDEO (57) Abstract The invention is a method for visually and audibly representing computer instructions for editing video which provides audio and/or visual information with such instructions for editing a video tape or film program. Audiovisual information is provided by storing with the identification of the source of each segment audiovisual representations of that segment. Typically, the instructions are stored on a computer and the audiovisual representations are digitized sequences of video images and sound, whereby an operator can request playback of the representations for any source segment.		

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METHOD FOR VISUALLY AND AUDIBLY REPRESENTING
COMPUTER INSTRUCTIONS FOR EDITING VIDEO

Cross-Reference to Related Applications

This application claims the benefit under 35 U.S.C. §120 of previously-filed, co-pending application Serial No. 07/867,125, filed April 10, 1992 and entitled "Method for Providing Visual Information with Instructions for Editing a Video Tape or Film Program," which is expressly incorporated by reference.

Field of the Invention

The invention belongs to the field of video and film editing. More particularly, the invention is related to methods for enabling a human user to understand computer instructions for editing video.

Background of the Invention

Completed video and film programs are generally composed of segments from several sources. The programs are typically assembled by an editor who views the sources of material that are available and chooses the segments that will make up the final program. However, the program is not usually edited at the same place or time as the physical production of the final video tape or film; instead, the final production occurs at a facility equipped to produce the high-quality editing that is required for the final product. Therefore, the original editor of the program must generate a set of editing instructions to be used in the construction of the final program which is commonly automated using computer technology.

A set of editing instructions for video or film programs is often produced in a format called an edit decision list (EDL). A conventional EDL consists of a sequence of editing instructions, each of which is a computer instruction for a computerized edit controller which assembles a final program from source material.

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An editing instruction represents an event description, where each event is a transition to a new program segment. There are a number of available EDL formats (CMX, GVG, Sony, etc.), but each conveys similar information. The event description contains such information as the source of the new program segment, the time codes describing both the portion of the source that will be recorded and its destination in the final program, and the type of edited transition that is to be used from the previous segment. Using the information represented by editing instructions, the final program can be automatically constructed from the several sources of program material.

However, there are several problems with using conventional EDL's for video editing. Although EDL formats were created in a form which allowed them to be read by people, they are not in a form that is readily understood, as they are intended primarily to be computer instructions. A conventional EDL contains only alphanumerical information describing the video or film program transitions. This information is usually sufficient to produce the program. However, it is impossible from a conventional EDL to visualize the final program or its sources. For example, if an EDL requires modification, the original source material must be examined to determine the effects of any modification. This problem could arise, for instance, if an EDL was created to produce a sixty-minute program, but the appropriate program length was subsequently determined to be fifty-five minutes, thus requiring material to be cut. If the original editor (i.e., the person who produced the EDL) is unavailable or does not remember the exact nature of the segments of the program, it is impossible to determine from the EDL alone which portions of the program should be cut.

Furthermore, because the video or film program represented by the EDL cannot be readily visualized, in order to view the final program it must be actually

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constructed from the EDL. For example, if the final program is a television commercial, it is common to have it approved by the advertiser. Because the program represented by the EDL cannot be readily visualized, the final video tape or film must be sent to the advertiser for prior approval, which is an expensive and time-consuming process.

Summary of the Invention

The invention disclosed herein is a method for visually and audibly representing computer instructions for editing video which provides audio and/or visual information along with editing instructions for a video tape or film program. The method involves, first, choosing the segments of video tape or film material to be incorporated into a video tape or film program, and then storing identifications of the sources of those segments of the program. Then, audio and/or visual information representative of each segment is stored so as to be associated with its corresponding identification of the source of the segment.

In one embodiment of the invention, the identification of the source of each segment includes an indication of the source tape or film of the segment and time codes indicating the points at which the segment begins and ends. The segment source identification can also indicate the type of transition (wipe, dissolve, etc.) that is to be used from the previous segment.

In a preferred embodiment of the invention, both the identifications of the segment sources and the visual representations are stored in computer-accessible forms, and the segment source identification includes a computer-readable pointer to the audio and/or visual representations for that segment. The visual representation is a sequence of images, and both the audio and visual representations can be in a digitized form. In a preferred embodiment, the invention provides a signal whereby an operator can request playback of the

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sequence of images and sound for any source segment. Ideally, both the segment source identifications and the digitized image and sound sequences are stored in the same computer file.

One possible means of implementing the storing and playback of the image sequences for the invention is to use QuickTime and WildMagic on the Apple Macintosh computer. QuickTime provides a means of playing back the sequence of images, and WildMagic allows the image sequence to be stored in a text file.

Brief Description of the Drawing

In the drawing,

Figure 1 is a block diagram of a computer system suitable for use with the present invention;

Figure 2 is a conventional edit decision list;

Figure 3 is a representation of a visual edit decision list with a digitized image sequence (shown in the figure as a still picture) associated with each element; and

Figure 4 is a graphical representation of a timeline representing a visual edit decision list.

Detailed Description

A conventional edit decision list (EDL) is a series of computer instructions for an edit controller 20 (Fig. 1) which produces an edited video or film program from several sources. The EDL is a list of editing instructions, each of which represents one segment of the program. Each editing instruction indicates the source of that segment (e.g., by the name of the video tape or film on which it is recorded) and the portion of the source, indicated by start and stop times, that makes up the segment. Edit decision lists are commonly generated using a computerized editing system 15 such as shown in Fig. 1.

Such a system 15 commonly includes a computer 22 with a volatile, typically random-access, memory 24

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connected to a central processing unit (CPU) 26 via a bus 28. Conventional computer systems, as well as those specially designed for video editing, may be used as the system 15 for the purpose of editing. More conventional computer systems may also include a printer 32 and non-volatile memory or storage 30, such as a hard disk or optical disk. The computer system 15 may be connected to an edit controller 20 to provide it with an EDL from which a video program may be created. The computer system 15 may also include a video display 34.

Figure 2 shows a typical EDL as it could appear on a computer display or as printed. This EDL is in CMX 340 format. (It should be noted that the particular EDL format used is not important for the invention, which is applicable to edit instructions generally.) This particular EDL is composed of eight editing instructions, each labeled by reference numeral 1. In this particular EDL, track type labels 2 indicate that one of the instructions describes the audio (A) portion of the program and the other seven instructions describe the segments of the video (V) portion. Each instruction, whether audio or video, indicates the origin of that segment by source label 3 and by source start time 4 and source stop time 5 of the segment. Similarly, destination start time 6 and destination stop time 7 indicate where that segment is to be recorded on the final program. Finally, transition type label 8 describes the type of transition (wipe, dissolve, etc.) that is to be used in moving to the segment described in the current editing instruction from the previous program segment.

To take a particular example of the EDL format, consider Element 3. Since track type label 2 for this element is "V", this element is a video segment. It is found on the tape or film labelled 1100511 from time code 06:46:25:03 to time code 06:46:26:03. Therefore, it is one minute long, and it is to be recorded from time code 01:00:01:00 to time code 01:00:02:00 on the

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"RECORD" tape or film. The edit transition from the previous segment to this one on the final tape is to be a cut, indicated by a "C" in transition-type label 8.

In the invention, the conventional EDL format is retained, but visual information is added. In the preferred embodiment of the invention, digital image sequences are added to the conventional EDL in a computer data file. Figure 3 shows the same EDL as in Figure 2 with the visual information added. Again, this is how the EDL would appear on a computer screen or display 34 or as printed via printer 20, though it should be noted that the images in the figure are very coarse and images on a computer screen are typically clearer. The visual EDL contains, as can be seen in Figure 3, all of the alphanumerical information in the conventional EDL, with the addition of a comment field 9, which can be used as shown in the figure to label the segment. Most importantly, though, it can also be seen in Fig. 3 that for each editing instruction in the EDL there is an image 10. In Fig. 3, where only a still image can be displayed, each element is shown with the starting image of that segment (in elements 1 and 2, the image is black because the program begins by dissolving from black).

A sequence of images and sound that can be played back at the operator's request is preferably provided. This is possible in the embodiment of the invention in which the EDL is stored and read on a computer. Digitized image and sound sequences can be stored in computer files from which they can be played over the computer display 34 (Fig. 1) and audio speakers. In the preferred embodiment of the invention, each instruction in the EDL points to digitized sequences of video images and sound for that segment. The operator reading the EDL can then play back the visual and audio portions of any segment. (Again, this capability is available only when the operator is using the EDL on the computer. When the EDL is printed to paper, only a still image is available.)

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The visual and audio sequences may be implemented in any of several ways. In general, the only requirements are for the ability to store the audio and visual sequences and to be able to reference those sequences from a file that contains the EDL text. A variety of general- and special-purpose computers can provide these capabilities. For example, Avid Technology, Inc., Burlington, Massachusetts, has a software-based digital picture and sound compression system that can be used to generate and store such sequences. Apple Computer Co., Cupertino, California, also markets two products that can be used for this purpose, QuickTime and WildMagic for Apple Macintosh computers. QuickTime provides the Macintosh system with the capability to play a sequence of images stored in the computer memory on the display, and WildMagic allows a movie file, or, more precisely, a pointer to a movie file, to be placed in a Macintosh text file. (Use of these products is well-known in the art.) Hence, using these two products, a digital movie file (created, for example, while editing the material and create the EDL) can be placed in the EDL text file. Normally, although the text file will contain a reference to the entire movie, only a single image will be visible on the screen. However, using the capability of QuickTime, the operator can click on that image (i.e., use the Macintosh mouse to point to the image, and then press the mouse button to indicate that location to the Macintosh) to play the movie while remaining in the EDL computer to see the digitized movie of any segment of the EDL.

In another embodiment of the invention, the visual EDL document has three main sections: Header, Timeline, and Events List.

The Header section contains information which describes the program as a whole. It may contain the program's title, the name of the application which created the list, format version number, and creation date. In addition to standard information always

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present in the header section, the user may add supplemental information such as a short summary. Various kinds of formatting and control data may also be present, such as the text font to be used or point size. The following is one example of a possible header section:

Avid Visual EDL Format

Inc. Generated by an Avid Media Composer, Version 5.0

VEDL Format: 1.0

Title: A Tahiti Travelog

Creation Date: February 20, 1992

The timeline section is a graphical depiction of the video program as a whole, such as shown in Fig. 4. Records tracks 40 (Video, Audio, Graphics, etc.) are arranged vertically, and program time is laid out horizontally. Time is represented by hour-minute-second-frame timecodes 42. Edits and transition effects are represented graphically with the use of icons 44 and other symbols. One possible representation, as a timeline, of part of the program, created by the EDL of Figs. 2 or 3, is shown in Fig. 4. The generation of a timeline can be done using common computer graphic programming techniques.

Following the timeline is the edit decision list. In a conventional EDL, each event would be represented by one or two lines of specially formatted number and letter sequences which indicate the channels present, source identifier, the event type, source and record timecodes. In this embodiment, the conventional EDL format is retained and augmented with a digital movie clip which illustrates each event with moving pictures and sound. Four typical events are shown here.

Another aspect of the invention is a "Viewer" application for viewing a visual EDL in accordance with the invention. The Viewer allows EDL documents

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to be displayed on a color or monochrome computer screen. Paging, scrolling, goto events, and other functions which may be provided using common techniques allow various sections of the document to be displayed. Event clips can be activated and played to illustrate the event's content. A system capable of performing such functions is described above. In addition to displaying visual EDL documents, the Viewer application may also: extract information to file using conventional EDL formats; print using conventional EDL formats; print a graphical representation; transmit EDL information; and receive EDL information

Extraction of conventional EDL data and its presentation in traditional file and print forms allows the visual EDL document continues to serve as an interchange format to other editing systems. Given a standard format for a visual EDL, common computer programming techniques can be used to generate a program to extract the conventional EDL information. This portability is highly useful, since the primary purpose of any EDL is to allow a video program to be assembled by an edit controller.

The visual EDL format is a completely new EDL format. As such, it is not currently supported by any other vendor of editing equipment, nor is it likely to be in the near future. A much closer level of cooperation among vendors is needed to handle video material than is need for text or sound. For this reason, by providing a function to extract EDL information and re-format it into one of several traditional EDL formats (CMX, GVG, Sony, etc.), the visual EDL document continues to serve as an interchange document. Extracted EDL files are machine-ready for loading into a target on-line system for creating a final video program.

The complement to extracting a traditional EDL file is printing in a traditional format. Printed

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files are quite useful during an on-line session for making notes, checking off edits assembled, etc. Most on-line editors are used to dealing with EDL information in one of these formats.

If a computer running the visual EDL Viewer application is physically near the on-line system (such as on a portable computer on the console, for example), the ability to format an EDL for the target system and transmit it serially to the system could be provided using well-known techniques. This capability is already provided by several EDL utilities and greatly enhances the effective use of VEDL documents.

In addition to a traditional EDL printout, the visual EDL document may be printed in a graphical form as well. This printout would include the timeline diagram, head frames of each video clip and any other visual information contained in the document. Naturally, sound and motion information cannot yet be reproduced on paper. Printing of such visual EDLs can be performed using the computer system described above.

Finally, the Viewer may allow new EDL data to be received from an on-line system and stored in a VEDL document. Blank clips are included as movie place holders for each edit instruction. A graphical timeline diagram is created and included using common graphic techniques and common processing steps, as found in conventional edit controllers, to construct a timeline. This allows capture of EDL information from the on-line system so it can be transported back to a system capable of adding video clips, etc.

There are several uses for visually represented EDLs. First, if modifications must be made to the EDL to produce the final program, the invention simplifies the process by allowing an editor to visualize the program from the edit decision list. For example, if a final program is intended for a four-minute television news spot, and its EDL provides instructions for a four-minute program, and a late

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story must be added to the news, it may be necessary to reduce the length of the original program. The person who had originally created the EDL for that program might remember which portions of which segments should be cut. But if that person is not available or does not remember each segment exactly, the invention allows another person to quickly view each segment to determine which portions of each segment are most easily omitted. With conventional EDLs, such a change would require using the EDL instructions to actually run the source material prior to deciding what to cut, a much more time-consuming process.

Another example of the usefulness of the invention is in the creation of commercials. When an agency creates a proposed television commercial, it must generally be approved by the advertiser. The advertiser could not use a conventional EDL to view the commercial, so it would be necessary to produce a final version for approval. The visual EDL invention, in contrast, allows the advertiser to see the final result, albeit in a somewhat less high-quality format, without the expense of producing a final video program that may not be approved. Moreover, changes could be suggested from viewing the EDL, which would greatly improve the turnaround time between successive versions of the commercial. Finally, only when the visual EDL is approved will it be necessary to have the final video program produced.

Having now described a few embodiments of the invention, it should be apparent to those skilled in the art that the foregoing is merely illustrative and not limiting, having been presented by way of example only. Numerous modifications and other embodiments are within the scope of one of ordinary skill in the art and are contemplated as falling within the scope of the invention as defined by the appended claims.

What is claimed is:

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Claims

1. A method for providing audio and/or visual information with instructions for editing a video program, comprising:

- a. choosing segments of video material to be incorporated into a video program;
- b. storing an identification of the source of each segment of the program; and
- c. storing with the identification of the source of each segment an audio and/or visual representation of that segment.

2. The method defined by claim 1, wherein the identification of the source of a segment includes an indication of the source tape or film for the segment and time codes indicating the points at which the segment begins and ends.

3. The method defined by claim 2, wherein the identification of the source of a segment includes an indication of the type of transition (wipe, dissolve, etc.) to be used from the previous segment.

4. A method for providing audio and/or visual information with instructions for editing a video tape or film program, comprising:

- a. choosing segments of video tape or film material to be incorporated into a video tape or film program;
- b. storing an identification of the source of each segment of the program in a computer-accessible form;
- c. storing an audio and/or visual representation of each segment in a computer-accessible form; and d. storing with the identification of each segment source a

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computer-readable direction to the audio and/or visual portion of the representation of that segment.

5. The method defined by claim 4, wherein the visual representation for a segment is a sequence of images.

6. The method defined by claim 5, wherein the audio and/or visual representations for a segment are in a digitized form.

7. The method defined by claim 6, wherein the segment source identifications and the digitized audio and/or visual representations are stored in a single computer file.

8. The method defined by claim 6, further comprising monitoring a signal whereby an operator can request playback of the audio and/or visual representations of for any segment.

9. A method for visually representing computer instructions for editing a video program, comprising:

- a. choosing segments of video material to be incorporated into a video program;
- b. storing an identification of the source of each segment of the program; and
- c. storing with the identification of the source of each segment an audio and/or visual representation of that segment.

10. The method defined by claim 9, wherein the identification of the source of a segment includes an indication of the source tape or film for the segment and time codes indicating the points at which the segment begins and ends.

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11. The method defined by claim 10, wherein the identification of the source of a segment includes an indication of the type of transition (wipe, dissolve, etc.) to be used from the previous segment.

12. A method for visually representing computer instructions for editing a video program, comprising:

- a. choosing segments of video tape or film material to be incorporated into a video tape or film program;
- b. storing an identification of the source of each segment of the program in a computer-accessible form;
- c. storing an audio and/or visual representation of each segment in a computer-accessible form; and d. storing with the identification of each segment source a computer-readable direction to the audio and/or visual portion of the representation of that segment.

13. The method defined by claim 12, wherein the visual representation for a segment is a sequence of images.

14. The method defined by claim 13, wherein the audio and/or visual representations for a segment are in a digitized form.

15. The method defined by claim 14, wherein the segment source identifications and the digitized audio and/or visual representations are stored in a single computer file.

16. The method defined by claim 14, further comprising monitoring a signal whereby an operator can request playback of the audio and/or visual representations of for any segment.

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17. A method for visually representing computer editing instructions of a video program, comprising the steps of:

a. generating and storing in a memory, a sequence of computer editing instructions, each identifying a source video and a segment of the source video;

b. storing, with each computer editing instruction a visual representation of the segment of the computer editing instruction.

18. The method of claim 17 further comprising the step of generating and storing, with the plurality of editing instructions, a graphical timeline representative of the video program.

19. A system for manipulating visual representations of computer instructions for editing video and audio, the system comprising:

a. means for receiving a visual edit decision list including edit instructions and associated video information;

b. means for displaying the visual edit instructions, including means for displaying the video information.

20. The system of claim 19 further comprising means for extracting the edit instructions from the visual representation of the computer instructions.

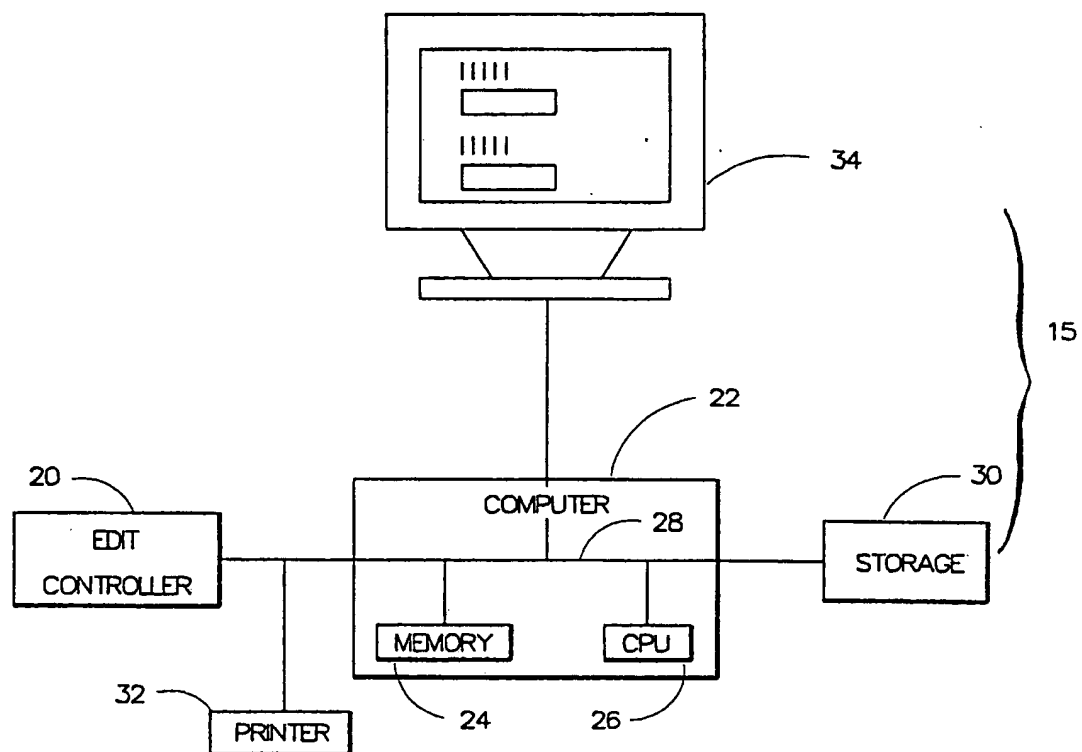


FIG. 1

- 2 / 4 -

TITLE: VISUAL EDL				
FCM: NON-DROP FRAME				
FCM: DROP FRAME				
001 055 A C	06:03:18:27	06:03:23:27	01:00:00:00	01:00:05:00
FCM: NON-DROP FRAME				
002 BL V C	00:00:00:00	00:00:00:00	01:00:00:00	01:00:00:00
FCM: DROP FRAME				
002 055 V D 015	06:46:56:25	06:46:57:25	01:00:00:00	01:00:01:00
003 055 V C	06:46:25:03	06:46:26:03	01:00:01:00	01:00:02:00
004 055 V C	06:41:55:00	06:41:55:15	01:00:02:00	01:00:02:15
M2 055 000.0	06:41:55:00			
* FREEZE FRAME:				
005 055 V C	06:42:29:00	06:42:29:15	01:00:02:15	01:00:03:00
006 055 V C	06:42:12:04	06:42:13:05	01:00:03:00	01:00:04:01
007 055 V C	06:03:18:27	06:03:19:11	01:00:04:01	01:00:04:15
008 055 V C	06:03:19:11	06:03:19:11	01:00:04:15	01:00:04:15
FCM: NON-DROP FRAME				
008 BL V W113 015	00:00:00:00	00:00:00:15	01:00:04:15	01:00:05:00

1 3 2 8 4 5 6 7

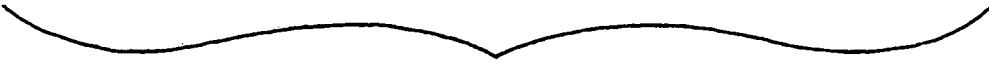


FIG. 2

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EDL TITLE: TAHITI
TOTAL TIME: 00:00:05:00

ELEMENT 1:



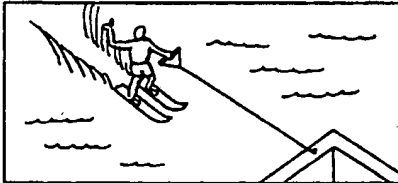
SOUND TRACK — 44.1 KHz
001 A C
TAHITI 06:03:18:27 06:03:23:27
RECORD 01:00:00:00 01:00:05:00

ELEMENT 2:



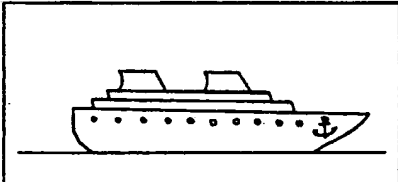
FADE IN TO AIRPLANE SHOT
002 V D 015
BLACK 00:00:00:00 00:00:00:15
TAHITI 06:46:56:25 06:46:57:25
RECORD 01:00:00:00 01:00:01:00

ELEMENT 3:



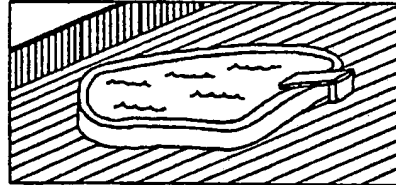
WATERSKING SHOT
003 V C
TAHITI 06:46:25:03 06:42:26:03
RECORD 01:00:01:00 01:00:02:00

ELEMENT 4:



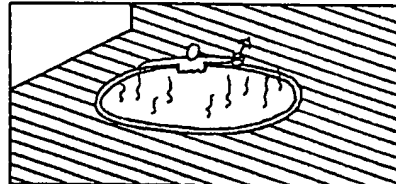
FREEZE FRAME OF SHIP
004 V C
TAHITI 06:41:55:00 06:41:55:15
RECORD 01:00:02:00 01:00:02:15
SPEED 000.0

ELEMENT 5:



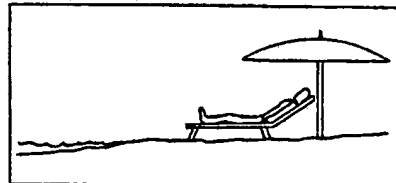
POOL AREA OF SHIP
005 V C
TAHITI 06:42:29:00 06:42:29:15
RECORD 01:00:02:15 01:00:03:00

ELEMENT 6:



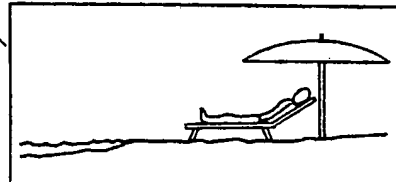
CREATURE COMFORTS IN HOT TUB
006 V C
TAHITI 06:42:12:04 06:42:13:05
RECORD 01:00:03:00 01:00:04:01

ELEMENT 7:



LYING ON THE BEACH
007 V C
TAHITI 06:03:18:27 06:03:19:11
RECORD 01:00:04:01 01:00:04:15

ELEMENT 8:



10 —
9 —
1 —
3 —
Wipe out to black
008 V W13 015
TAHITI 06:03:19:11 06:03:19:11
BLACK 00:00:00:00 00:00:00:15
RECORD 01:00:04:15 01:00:05:00
6 — 4 — 7 — 5 — 8

FIG. 3

4/4

U	WATER SKYING		WATER SKYING
A1	BEACH BABE		
A2	BEACH BABE		
TC	00:00	01:00:01:00	

U	HOT TUB,FF01	HOT TUB	HOT TUB
A1			
A2			
TC	01:00:02:00	01:00:03:00	

U	BEACH BABE	
A1		
A2		
TC	01:00:04:00	01:00

FIG. 4

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 93/03360

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 G11B27/028; G11B27/031; G11B27/34		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	G11B	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	US,A,5 101 364 (DAVENPORT ET AL.) 31 March 1992 see column 2, line 56 - column 14, line 20 ---	1-6,8,9, 11-17
X	EP,A,0 268 270 (MATSUSHITA ELECTRIC INDUSTRIAL CO.,LTD.) 25 May 1988 see column 3, line 1 - column 14, line 38 ---	1,4-6,8, 9,12-14, 16,17
A	---	2,7,10, 15
A	EP,A,0 403 118 (IBM CORP.) 19 December 1990 see column 4, line 50 - column 21, line 34 ---	1,3-6,8, 9,11-14, 16,17, 19,20
-/--		
<p>¹⁰ Special categories of cited documents : ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
27 JULY 1993	09.08.93	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	DAALMANS F.J.	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	<p>FERNSEH UND KINO TECHNIK vol. 45, no. 5, 1991, HEIDELBERG, DE , XP229093 KRIEG P 'Multimedia-Computer und die Zukunft des Film/Videoschnitts' ; pages 252-254, 256 and 258; see page 253, r-h col., chapter 3 --page 258, middle col., line 11 ---</p>	1-6, 8-14, 16-20
A	<p>EP, A, 0 438 299 (SONY CORPORATION) 24 July 1991 see column 5, line 3 - column 15, line 12 ---</p>	1-5, 8-13, 16, 17, 19, 20
A	<p>WO, A, 9 110 321 (AVID TECHNOLOGY , INC.) 11 July 1991 see the whole document ---</p>	1, 4, 9, 12, 17, 19
A	<p>EP, A, 0 113 993 (MONTAGE COMPUTER CORPORATION) 25 July 1984 see page 27, line 1 - page 99, line 17 ---</p>	1, 4, 9, 12, 17, 19
P, X	<p>EP, A, 0 526 064 (THE GRASS VALLEY GROUP, INC.) 3 February 1993 see the whole document -----</p>	1-5, 8-13, 16-19

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

US 9303360
SA 73295

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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EP-A-0526064	03-02-93	None	